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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Greg Galazin

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EXAMINER

MCCREARY, LEONARD

ART UNIT

PAPER NUMBER

3616

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/800,953

Applicant(s)

GALAZIN ET AL.

Examiner

Leonard J. McCreary, Jr.

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-8, 10-20 and 22-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7, 8, 10-20, 22-27 and 29-31 is/are rejected.
- 7) ☒ Claim(s) 6 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. Claims 10 and 22 objected to because of the following informalities: The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following terms are required: claim 10, line 13 "encapsulated," claim 22, line 11 "cantilevered."

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 10-11 and 22-31 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Re claim 10, the specification discloses neither the structure of a completely encapsulated cavity, nor the importance of such a feature. Re claim 22, the specification discloses neither the structure of a cantilevered lip, nor the importance of such a feature.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 12 stands rejected under 35 U.S.C. 102(b) as being anticipated by US 2002/0130480 to VanDenberg. VanDenberg discloses a trailing arm suspension comprising:

- a. The second end of each trailing arm further comprising a lip extending radially outward from the aperture and at least one engagement surface 47, 49 extending radially outward from the lip and adapted to abut a bushing-removal tool (claim 12.)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0130480 to VanDenberg in view of US 3,904,300 to Hetmann. VanDenberg

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discloses a variable compliance pivot assembly and suspension system comprising the following:

- b. A suspension system for suspending a vehicle frame above a plurality of ground-engaging wheels, comprising: a wheel-carrying axle 4 comprising a first end and a second end; a pair of frame bracket assemblies 14 each comprising a resiliently-bushed pivotable connection 34 defining a pivot axis, the frame bracket assemblies operably coupled to opposite sides of the vehicle frame, the resiliently-bushed pivotable connection comprising a substantially cylindrically shaped bushing 40; and a pair of trailing arms 20 each comprising a first end 58 operably coupled to the first end and the second end of the axle, respectively, and a second end 32 comprising an aperture 38 that receives the bushing of one of the frame bracket assemblies therein, wherein the aperture of the second end of each trailing arm is noncircular (para 0036, lines 8-9), thereby causing a nonsymmetrical compression of the bushing about the pivot axis (para 0039, lines 1-7) (claim 1.)
 - c. The aperture of the second end of each trailing arm is symmetrical with respect to a substantially horizontal plane (Fig. 8) [0045] (claim 2.)
 - d. The aperture is oriented so as to apply a greater compression in a substantially horizontal direction than in a substantially vertical direction (para 0039, lines 1-16) (claim 3.)
5. VanDenberg does not teach an oval-shaped aperture. Hetman discloses an elastic joint and teaches:

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- e. A resiliently-bushed pivotal connection having a cylindrical bushing and a oval-shaped aperture (col 3, lin 54-56), thereby causing a nonsymmetrical compression of the bushing about the pivot axis (col 4, lin 3-9) (claim 1.)
- 6. Re claim 1, it would have been obvious to one of ordinary skill in the art at the time the apparatus was made to modify the trailing arm suspension of VanDenberg to include oval-shaped apertures as taught by Hetman so as to provide different resilience along different operational axes (col 4, lin 3-23.)
- 7. Claims 7-8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0130480 to VanDenberg in view of US 2004/0056446 to Dudding et al. and further in view of US 7,048,288 to Chan et al. The disclosure of VanDenberg is discussed above and further discloses:
 - f. A suspension system for suspending a vehicle frame above a plurality of ground-engaging wheels, comprising: a wheel-carrying axle 4 comprising a first end and a second end; a pair of frame bracket assemblies 14 each comprising a frame bracket and a resiliently-bushed pivotable connection 34, the frame bracket assemblies operably coupled to opposite sides of the vehicle frame; and a pair of trailing arms 20 each comprising a first end operably coupled to the first end 28 and the second end 32 of the axle, respectively, and a second end comprising an aperture 38 that receives the resiliently-bushed pivotable connection 40 of one of the frame bracket assemblies therein (Fig. 2) (claim 7.)
 - g. The second end of each trailing arm is cylindrically shaped (claim 8.)

8. VanDenberg discloses neither a pair of I-beam shaped trailing arms nor a tapered top plate. Dudding discloses a trailing arm suspension and teaches:

h. A pair of I-beam shaped trailing arms each comprising a top place, a bottom plate, and a web extending between the top and bottom plates (fig. 1) (claim 7.)

i. The second end of each trailing arm is cylindrically shaped (claim 8.)

9. Chan discloses a vehicle suspension trailing beam and teaches:

j. The top plate includes a first thickness substantially proximate the first end and a second thickness substantially proximate the second end that is less than the first thickness (fig. 1) (claim 7.)

10. Re claim 7, it would have been obvious to one of ordinary skill in the art at the time the apparatus was made to modify the trailing arm suspension of VanDenberg to include I-beam shaped trailing arms as taught by Dudding so as to increase the rigidity/weight ratio of the beam, the purpose for which I-beams are typically selected. It would have been obvious to one of ordinary skill in the art at the time the apparatus was made to modify the trailing arm suspension of VanDenberg to include a tapered top plate as taught by Chan so as to provide a seat for an air spring (col 5, lin 7-9.)

11. Claims 5, 13, 22-27 and 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0130480 to VanDenberg. The disclosure of VanDenberg is discussed above and further discloses:

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12. A suspension system for suspending a vehicle frame above a plurality of ground-engaging wheels, comprising: a wheel-carrying axle 4 comprising a first end and a second end; a pair of frame bracket assemblies 14 each comprising a resiliently-bushed pivotable connection 34, the frame bracket assemblies operably coupled to opposite sides of the vehicle frame, the resiliently-bushed pivotable connection comprising an elastically deformable bushing 40; and a pair of trailing arms 20 each comprising a first end 58 operably coupled to the first end and the second end of the axle, respectively, and a second end 32 comprising an aperture 38 that receives the bushing of one of the frame bracket assemblies therein, the aperture defining an inner surface (claim 5.)

13. VanDenberg further discloses an aperture in the second end of each trailing arm that has a nonuniform inner surface (claim 26.) Although VanDenberg meets all of the structural limitations of the claims, VanDenberg does not specifically teach casting the trailing arms. Re claims 5 and 27, it would have been obvious to one of ordinary skill in the art at the time of invention to leave the inner surface rough or to increase roughness so as to increase the rotation resistance since it is old and well-known that bushings are often press fit or vulcanized for this purpose. Re claims 13 and 22, it would have been obvious to one of ordinary skill in the art at the time of invention to manufacture the trailing arms according to old and well-known metal forming processes such as casting, welding, forging, hydroforming, magnaforming, etc. Further, the examiner notes that the method of forming is not germane to the issue of patentability of the device itself.

14. Claims 10-11 and 30-31 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0130480 to VanDenberg in view of US 6,241,266 to Smith et al. The disclosure of VanDenberg is discussed above. VanDenberg does not teach a trailing arm with a cavity or a slot at the first end. Smith discloses a trailing arm suspension with a wrapper compression axle mounting having:

k. A mating surface of the first end of each of the trailing arms comprises a cavity 310 that is completely encapsulated when the trailing arm is coupled to the axle, thereby reducing a localized stress transferred from the trailing arms to the axle (claims 10, 30.)

15. Re claims 10 and 30, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the suspension system of VanDenberg to include a mating surface in the form of an encapsulated cavity or a slot at the first end of the trailing arms as taught by Smith so as to mount an axle to a trailing arm suspension without weakening the axle (column 1, lines 18-23.) Re claim 11, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the suspension system of VanDenberg to include a cavity of substantially circular shape at the end of the trailing arms as taught by Smith so as to accommodate and provide stress relief for round axles.

16. Claims 14 and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0130480 to VanDenberg in view of US 5,836,698 to Richardson. The disclosure of VanDenberg is discussed above. VanDenberg does not teach a tool

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engagement surface with apertures. Richardson discloses an apparatus for removal and installation of strut bearings and teaches the following:

- I. At least one engagement surface includes a first pair of engagement surfaces, and a second pair of engagement surfaces, wherein the first pairs and second pairs of engagement surfaces extend radially outward (Fig. 2.) (claim 14.)
 - m. Each of the engagement surfaces includes an aperture extending therethrough (Fig. 2) (claim 15.)
17. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the axle suspension system of VanDenberg to include the bushing removal tool engagement surfaces as taught by Richardson so as to increase serviceability of the bushings (column 1, lines 19-23.)

18. Claims 16-18 and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over 5,366,237 to Dilling et al. Dilling discloses a trailing arm axle suspension comprising the following:

- n. A suspension system for suspending a vehicle frame above a plurality of ground-engaging wheels, comprising: a wheel-carrying axle 7 comprising a first end and a second end; a pair of frame bracket assemblies 41, 55 operably coupled to opposite sides of the vehicle frame; and a pair of shock absorbers 57 each comprising a first end operably coupled to the vehicle frame (Fig. 8) and a second end; and a pair of trailing arms 42, 69 each comprising a first end operably coupled to the first end and the second end of the axle, respectively, a

second end operably coupled to one of the frame bracket assemblies, and an outwardly extending shock support tang (Fig. 12) operably coupled to one of the shock absorbers (claim 16.)

o. The shock support tang is located proximate the first end of the trailing arm (claim 17.)

p. A pair of air springs 69 each comprising a flexible boot; and a pair of trailing arms 69 each comprising a first end operably coupled to the first end and the second end of the axle 7, respectively, a second end operably coupled to one of the frame bracket assemblies 55, and a top surface comprising a first portion and a second portion (Fig. 12), wherein the second portion is adapted to support one of the air springs thereon, and wherein the second portion extends above the first portion (claim 18.)

19. Dilling does not specifically teach casting the trailing arms. Re claims 16 and 20 it would have been obvious to one of ordinary skill in the art at the time of invention to manufacture the trailing arms according to old and well-known metal forming processes such as casting, welding, forging, hydroforming, magnaforming, etc. Further, the examiner notes that the method of forming is not germane to the issue of patentability of the device itself. Re claim 18, the functional recitation "thereby substantially reducing an amount of contact between the trailing arm and the boot of the air spring when the air spring is in a deflated condition" does not serve to distinguish over the structure of Dilling. In order to be given patentable weight, a functional recitation must be expressed as a "means" for performing the specified function, as set forth in 35USC

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112, 6th paragraph, and must be supported by recitation in the claim of sufficient structure to warrant the presence of the functional language. *In re Fuller*, 1929 C.D. 172; 388 O.G. 279.

20. Claim 19 stands rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,366,237 to Dilling et al. in view of US 2004/0056446 to Dudding et al. The disclosure of Dilling is discussed above. Dilling does not teach the trailing arm with an I-beam-shaped cross section. Dudding discloses an air spring and air spring mounting assembly and teaches a cast trailing arm with an irregular I-beam-shaped cross section. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Dilling's axle suspension system comprising a trailing arm having a top flange with first and second portions to cast the trailing arm with an irregular I-beam-shaped cross section as taught by Dudding so as to maintain a simple yet rigid beam especially conducive to the process of casting.

Allowable Subject Matter

21. Claims 6 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

22. Applicant's arguments with respect to claims 1-3, 7-8, and 10-11 have been considered but are moot in view of the new ground(s) of rejection. Re the remaining claims, applicant's arguments have been fully considered but they are not persuasive.

23. Re claim 12, applicant argues VanDenberg does not disclose a lip extending radially outward from an aperture and at least one engagement surface extending radially outward from the lip. Examiner disagrees and notes that VanDenberg figure 3 clearly discloses a lip 44, 45 extending radially outward from an aperture and at least one engagement surface 47, 49 extending radially outward from the lip, the engaging surface being capable abutting a bushing removal tool, and further notes that it has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation, but only requires the ability to so perform; it does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

24. Re claim 5, applicant argues neither providing a press-fit of a bushing within a particular aperture nor vulcanizing a bushing within an aperture results in a roughed-inner surface of such aperture, nor would either approach render obvious a roughed inner surface. Examiner notes that the previous Office Action made no claim that pressing or vulcanizing a bushing into an aperture results in a roughed surface. These processes provide examples of similar applications wherein it is old and well known in the art that it is desirable to prevent a bushing from rotating within its aperture. Various forms of roughed surfaces – such as knurls, splines, ribs, and abrasives, etc. – are old

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and well known structures employed to increase friction between two components to eliminate or reduce undesired relative movement. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., no requirement of special tools to install the bushing) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993.)

25. Re claim 22, applicant argues VanDenberg does not disclose a cantilevered lip that would provide sufficient area so as to abut an associated hanger bracket and define operating limits. Examiner disagrees and draws attention to VanDenberg figures 2 and 3, which make it apparent that the cantilevered lips 47, 49 abut the hanger bracket 26 to resist rotational movement of the trailing arm 20 about its longitudinal axis and thus define its operational limits.

26. Re claim 10, applicant argues that the references do not teach a pair of trailing arms including a first end having a mating surface that comprises a cavity that is completely encapsulated when the trailing arm is coupled to the axle. Examiner disagrees and draws attention to Smith figure 26, which clearly shows the same cavity structure as that shown in figure 13 of the present application, the mating surface of Smith having a cavity structure 310 that is completely encapsulated by U-shaped plate 304 and the axle 90. Further, Smith teaches that the purpose of the cavity structure disclosed is to prevent stress risers in the axle (col 16, line 32-35.)

27. Re claim 16, applicant argues Dilling fails to disclose a shock tang as being formed as an integral part of the frame bracket. Examiner disagrees noting the shock tang of Dilling is clearly attached to the frame bracket, further noting that it has been held that the term "integral" is sufficiently broad to embrace constructions united by such means as fastening and welding. *In re Hotte*, 177 USPQ 326, 328 (CCPA1973.)

28. Re claim 18, applicant argues the two-surface configuration of Dilling does not provide any additional clearance that would substantially reduce an amount of contact between a trailing arm and a boot of an airbag. Examiner notes that the structure of Dilling encompasses the structure of the present application as broadly recited, and further notes that it has been held that the functional "thereby" statement does not define any structure and accordingly cannot serve to distinguish over the prior art. *In re Mason*, 114 USPQ 127, 44 CCPA 937 (1957.)

Conclusion

29. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the


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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard J. McCreary, Jr. whose telephone number is 571-272-8766. The examiner can normally be reached on 0700-1700 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Dickson can be reached on 571-272-6669. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



DAVID R. DUNN
PRIMARY EXAMINER



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